



Compatibility Testing of Body Shop Applied Adhesive and Sealer with Metallic Substrates

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This standard is used to test the compatibility of body shop applied adhesive and sealer with metallic substrates.

1.2 Applicability. Materials include ferrous and non-ferrous sheet materials.

1.3 Remarks. None.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

ASTM D1876 ISO 10365

2.2 GM Standards/Specifications.

GMW18076 GMW18077

2.3 Additional References. None.

3 Resources

3.1 Facilities.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.2 Equipment.

3.2.1 Circulation oven, capable of maintaining a set temperature within ± 3 °C.

3.2.2 Cartridge gun.

3.2.3 Pliers.

3.2.4 Spatula.

3.2.5 Tension Testing Machine.

3.3 Test Vehicle/Test Piece.

3.3.1 Number of Test Samples. For initial approval, the compatibility shall be determined with a minimum of five (5) test coupons per test condition.

3.3.2 Adhesive/Sealer. Test each metallic substrate with each chemical type of adhesive/sealer. Choose from GM approved products released under the corresponding Material Specification. Consult GM Materials Engineering for a list of approved adhesive/sealers. At a minimum, the types of adhesive/sealers to be tested include:

- Low expanding antilflutter material according to GMW18076 LE-HS
- Crash toughened adhesive according to GMW18077 HS-IR
- Medium strength structural adhesive with glass beads according to GMW18077 MS-GB
- Low strength Hem Adhesive with glass beads according to GMW18077 LS-GB

3.4 Test Time.

Calendar time:	4 d
Test time:	3 d
Coordination time:	1 d

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Testing shall be performed by personnel that have been trained in laboratory operations and safety.

4 Procedure

4.1 Preparation. All substrates shall be tested in the clean and unoled condition.

4.1.1 T-Peel. Compatibility of metal substrates shall be determined using T-Peel testing according to ASTM D1876. T-Peel testing shall be conducted no sooner than 24 h after curing the test coupons.

4.1.2 Test Substrate Cleaning. Clean the test substrate coupons for at least 2 minutes at $23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ in high-grade white spirit using an ultrasonic bath. After drying, the panel must show a grey clean surface without any flow marks. Repeat cleaning operation with fresh high-grade white spirit as necessary.

4.1.3 Coupon Cure. Test coupons shall be cured using the nominal bake schedules as described in the associated adhesive material specifications.

4.2 Conditions.

4.2.1 Environmental Conditions. Not applicable.

4.2.2 Test Conditions. T-Peel testing shall be performed at room temperature, $23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$, i.e., initial condition.

4.3 Instructions.

4.3.1 Test Procedure. After curing according to 4.1.3, the test pieces shall be stored for 24 h minimum at $+23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$. The test shall be performed immediately after conditioning per ASTM D1876.

5 Data

5.1 Calculations. Record the percentage of adhesive and cohesive separation modes.

5.1.1 Separation mode. Separation mode evaluation and rating shall be performed according to ISO 10365.

5.2 Interpretation of Results. Results for each test coupon shall meet the requirements stated in the relevant Material Specification for each adhesive/sealer material tested.

5.3 Test Documentation. The test results shall be reported with reference to the metallic substrate to be tested and the applied curing schedule.